

AMENDMENTS TO THE SPECIFICATION

1. Please replace the paragraph beginning at line 1, page 6 with the following amended paragraph:

DETAILED DESCRIPTION OF THE INVENTION

The invention disclosed herein pertains to methods for determining the amount of nitrogen in successive samples of a gas mixture. The methods are "two-step" methods that each provides a near-real-time means for determining the nitrogen diluent gas content of the gas. The methods are particularly useful for natural gas mixtures, and are described herein in that context, but the methods may be applied to other gas mixtures as well.

As explained below, the methods comprise a first step of transforming the nitrogen in the gas such that it may be detected by nondispersive infrared detection. In the following description, two examples of such a first step are described: applying a chemical reforming process to the gas to produce gaseous ammonia or, alternatively, using direct excitation-dissociation-formation processes to generate nitrogen molecular ions. The second step is using infrared detection to sense the reformed ammonia product, or infrared-active molecular ions of nitrogen, to infer and determine the original nitrogen content of the gas.

2. Please replace the paragraph beginning at line 23, page 6 with the following amended paragraph:

Chemically reforming the gas to create ammonia

In a first embodiment, the first step is a chemical reforming process. In chemical reforming, the composition of the natural gas, using only its self-contained constituents, is transformed, in part, to other compounds that are formed by dissociating and combining the constitutive elements of the original gas. In particular, the molecular nitrogen (N_2) is reformed to produce ammonia (NH_3) by dissociating and associating part or all of the nitrogen with hydrogen derived from dissociating the abundant amount of methane (CH_4) in the gas. The second step is a quantitative measurement of the ammonia produced by the

reforming process from which the original nitrogen content of the natural gas may be determined.